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| Substitute for form 1449A/PTO | | | | Application Number | 10/066,095 |
| INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary) | | | | Filing Date | 1/31/2002 |
| | | | | First Named Inventor | Steven Teig et al. |
| | | | | Group Art Unit | 3628-2825 |
| | | | | Examiner Name | Cheneinski, S. Bowers |
| Sheet | 1 | of | 9 | Attorney Docket Number | SPLX.P0074 |

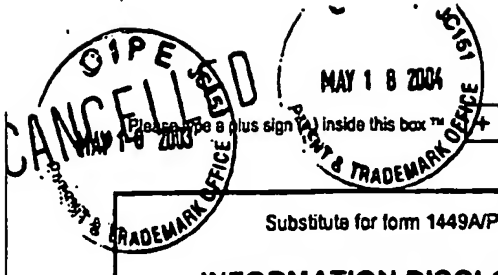
| U.S. PATENT APPLICATIONS | | | | | | |
|--------------------------|-----------------------|-------------------------|------------------------|---|---------------------------|--|
| Examiner Initials | Cite No. ¹ | U.S. Patent Application | | Name of Patentee or Applicant of Cited Document | Date of Filing MM-DD-YYYY | Related Application Data if any |
| | | Serial Number | Attorney Docket Number | | | |
| BB | 1. | 10/066,060 | SPLX.P0072 | Steven Teig | 01-31-2002 | Application filed on the same date, with same specification and drawings, but with different summary and abstract. |
| BB | 2. | 10/066,160 | SPLX.P0073 | Steven Teig | 01-31-2002 | Application filed on the same date, with same specification and drawings, but with different summary and abstract. |
| BB | 3. | 10/066,047 | SPLX.P0078 | Steven Teig et al. | 01-31-2002 | Application filed on the same date, with same specification and drawings, but with different summary and abstract. |
| BB | 4. | 10/061,641 | SPLX.P0079 | Steven Teig et al. | 01-31-2002 | Application filed on the same date, with same specification and drawings, but with different summary and abstract. |
| BB | 5. | 10/066,094 | SPLX.P0080 | Steven Teig et al. | 01-31-2002 | Application filed on the same date, with same specification and drawings, but with different summary and abstract. |
| BB | 6. | 10/076,121 | SPLX.P0081 | Steven Teig et al. | 02-12-2002 | CIP of 10/066,094.. |
| BB | 7. | 10/062,995 | SPLX.P0105 | Steven Teig et al. | 01-31-2002 | Application filed on the same date, with same specification and drawings, but with different summary and abstract. |
| BB | 8. | 10/066,102 | SPLX.P0106 | Steven Teig | 01-31-2002 | Application filed on the same date, with same specification and drawings, but with different summary and abstract. |
| BB | 9. | 10/066,187 | SPLX.P0133 | Steven Teig et al. | 01-31-2002 | Application filed on the same date, with same specification and drawings, but with different summary and abstract. |
| BB | 10. | 10/286,584 | CDN.P0037 | Steven Teig | 10-31-2002 | |
| BB | 11. | 10/335,087 | CDN.P0038 | Steven Teig et al. | 12-31-2002 | |
| BB | 12. | 10/335,239 | CDN.P0039 | Steven Teig et al. | 12-31-2002 | |

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|--------------------|----------------------|-----------------|----------|
| Examiner Signature | <i>Burton Bowers</i> | Date Considered | 12/13/04 |
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| | | | | Examiner Name | Chencinski, S. <i>Bowers</i> |
| Sheet | 2 | of | 9 | Attorney Docket Number | SPLX.P0074 |

| U.S. PATENT APPLICATIONS | | | | | | |
|--------------------------|-----|------------|-----------|--------------------|------------|--|
| BB | 13. | 10/335,086 | CDN.P0040 | Steven Teig et al. | 12-31-2002 | |

| FOREIGN PATENT DOCUMENTS | | | | | | | | |
|--------------------------|-----------------------|-------------------------|---------------------|-----------------------------------|--------------------------------|---|---|----------------|
| Examiner Initials | Cite No. ¹ | Foreign Patent Document | | | Date of Publication MM-DD-YYYY | Name of Patentee or Applicant of Cited Document | Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear | T ² |
| | | Office ³ | Number ⁴ | Kind Code (if known) ⁵ | | | | |
| BB | 14. | JP | 11-296560 | | 10-29-1999 | Matsumoto et al. | with English translation of Abstract; | |
| BB | 15. | JP | 2000-082743 | | 03-21-2000 | Igarashi et al. | with Japanese Patent Office's English translation of Abstract; and with English translation of the application. | ✓ |
| BB | 16. | JP | 64-15947 | | 01-19-1989 | Ouchi | with English translation of Abstract; | |
| BB | 17. | JP | 03-173471 | | 07-26-1991 | Tawada et al. | with Japanese Patent Office's English translation of Abstract; and with English translation of the application. | ✓ |
| BB | 18. | JP | 04-000677 | | 01-06-1992 | Fujiwara et al. | with English translation of Abstract; | |
| BB | 19. | JP | 05-102305 | | 04-23-1993 | Sato | with Japanese Patent Office's English translation of Abstract; and with English translation of the application. | ✓ |
| BB | 20. | JP | 05-243379 | | 09-21-1993 | Kubota | with Japanese Patent Office's English translation of Abstract; | ✓ |

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Considered
3/14/06
Brian Bowers



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| | | | | Group Art Unit | 3628 2826 |
| | | | | Examiner Name | Chencinski, S. Bowers |
| Sheet | 3 | of | 9 | Attorney Docket Number | SPLX.P0074 |

FOREIGN PATENT DOCUMENTS

| | | | | | | | |
|----|-----|----|-----------|------------|---------|---|---|
| | | | | | | and with English translation of the application. | |
| BB | 21. | JP | 07-086407 | 03-31-1995 | Miura | with Japanese Patent Office's English translation of Abstract; and with English translation of the application. | ✓ |
| BB | 22. | JP | 09-162279 | 06-20-1997 | Yoshida | with Japanese Patent Office's English translation of Abstract; and with English translation of the application. | ✓ |

NON PATENT LITERATURE DOCUMENTS

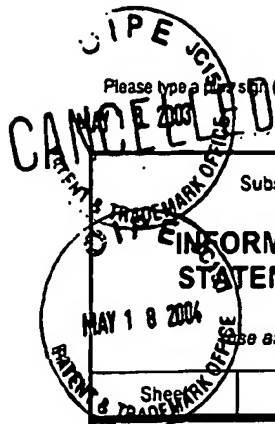
| Examiner Initials | Cite No. | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published. | T ² |
|-------------------|----------|---|----------------|
| BB | 23. | Chen, H.F. et al., A Faster Algorithm for Rubber-Band Equivalent Transformation for Planar VLSI Layouts, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems, vol. 15, No. 2, February 1996, pp. 217-227. | |
| BB | 24. | Chip Model with Wiring Cost Map, August 1983, IBM Technical Disclosure Bulletin, vol. 26, issu. 3A, pp. 929-933 | |
| BB | 25. | Dayan, T. et al., Layer Assignment for Rubber Band Routing, UCSC-CRI-93-04, January 20, 1993. | |
| BB | 26. | Dayan, T., Rubber-Band Based Topological Router, A Dissertation, UC Santa Cruz, June 1997. | |
| BB | 27. | Dood, P. et al. A Two-Dimensional Topological Compactor with Octagonal Geometry, 28 th ACM/IEEE Design Automation Conference, pp 727-731, July 1991. | |

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| | | | First Named Inventor | Steven Teig et al. | |
| | | | Group Art Unit | 3628 <i>2828</i> | |
| | | | Examiner Name | Ghencinski, S. <i>Bauer</i> | |
| Sheets | 4 | of | 9 | Attorney Docket Number | SPLX.P0074 |

NON PATENT LITERATURE DOCUMENTS

| | | | |
|-------------|-----|--|--|
| <i>BB</i> | 28. | Fujimura, K. et al, Homotopic Shape Deformation. | |
| <i>BB</i> | 29. | Hama, T. et al., Curvilinear Detailed Routing Algorithm and its Extension to Wire-Spreading and Wire-Fattening. | |
| <i>BB</i> | 30. | Hama, T. et al., Topological Routing Path Search Algorithm with Incremental Routability Test, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems, vol. 18, No. 2, February 1999, pp. 142-150. | |
| <i>BB</i> | 31. | Kobayashi, K. et al., A New Interactive Analog Layout Methodology based on Rubber-Band Routing, UCSC-CRL-96-12, June 13, 1996. | |
| <i>BB</i> | 32. | Lim, A. et al, A Fast Algorithm To Test Planar Topological Routability, Technical Report 94-012, pp. 1-16. | |
| <i>BB</i> | 33. | Lu, Y., Dynamic Constrained Delaunay Triangulation and Application to Multichip Module Layout, A Thesis for Master of Science, UC Santa Cruz, December 1991. | |
| <i>BB</i> | 34. | Maley, F.M., Testing Homotopic Routability Under Polygonal Wiring Rules, Algorithmica 1996, 15: 1-16. | |
| <i>BB</i> | 35. | Morton, P. B. et al., An Efficient Sequential Quadratic Programming Formulation of Optimal Wire Spacing for Cross-Talk Noise Avoidance Routing, UCSC-CRL-99-05, March 10, 1999. | |
| <i>BB</i> | 36. | NN71091316, Use of Relatively Diagonal And Rectangular Wiring Planes n Multilayer Packages, September 1971, IBM Technical Disclosure Bulletin, Vol. No. 14, Issue No. 4, pp. 1316-1317. | |
| <i>BB</i> ✓ | 37. | Staepelaere, D. et al., Geometric Transformations for a Rubber-Band Sketch, A Thesis for a Master of Science in Computer Engineering, UCSC, September 1992. | |
| <i>BB</i> ✓ | 38. | Staepelaere, D. et al., Surf: A Rubber-Band Routing System for Multichip Modules, pp 18-26, 1993. | |
| <i>BB</i> ✓ | 39. | Su, J. et al., Post-Route Optimization for Improved Yield Using Rubber-Band Wiring Model, 1997 International Conference on Computer-Aided Design, pp 700-706, November 1997. | |
| <i>BB</i> ✓ | 40. | Wei-Ming Dai, W. et al., Routability of a Rubber-Band Sketch. 28 th ACM-IEEE Design Automation Conference, 1991. pp. 45-65. | |
| <i>BB</i> ✓ | 41. | Xing, Z. et al., A Minimum Cost Path Search Algorithm Through Tile Obstacles, slide presentation. | |
| <i>BB</i> ✓ | 42. | Xing, Z. et al., Shortest Path Search Using Tiles and Piecewise Linear Cost Propagation, IEEE, 2002, pp.145-158. | |

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|--------------------|---------------------|-----------------|----------|
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NON PATENT LITERATURE DOCUMENTS

| | | | |
|-------------|-----|---|--|
| <i>LD</i> ✓ | 43. | Xu, A More Efficient Distance Vector Routing Algorithm, UCSC-CRL-96-18, March 1997. | |
| <i>DB</i> ✓ | 44. | Yu, M.-F. et al., Fast and Incremental Routability Check of a Topological Routing Using a Cut-Based Encoding, UCSC-CRL-97-07, April 14, 1997. | |
| <i>DB</i> ✓ | 45. | Yu, M.-F. et al, Interchangeable Pin Routing with Application to Package Layout, UCSC-CRL-96-10, April 25, 1996. | |
| <i>DB</i> ✓ | 46. | Yu, M.-F. et al., Pin Assignment and Routing on a Single-Layer Pin Grid Array, UCSC-CRL-95-15, February 24, 1995. | |
| <i>BB</i> ✓ | 47. | Yu, M.-F. et al., Planar Interchangeable 2-Terminal Routing, UCSC-CRL-95-49, October 19, 1995. | |
| <i>BB</i> ✓ | 48. | Yu, M.-F. et al., Single-Layer Fanout Routing and Routability Analysis for Ball Grid Arrays, UCSC-CRL-95-18, April 25, 1995. | |
| <i>DB</i> ✓ | 49. | Ahuja, R. et al., Faster Algorithms for the Shortest Path Problem, Journal of the Association for Computing Machinery, vol. 37, No. 2, April 1990, pp. 213-223. | |
| <i>DB</i> ✓ | 50. | Alexander, M. et al., Performance-Oriented Placement and Routing for field-programmable gate arrays, Proceedings of the European Design Automation Conference, pages 80-85, 1995. | |
| <i>BB</i> ✓ | 51. | Alexander, M. et al., Placement and Routing for Performance-Oriented FPGA Layout, VLSI Design, Vol. 7, No. 1, 1998. | |
| <i>DB</i> ✓ | 52. | Andou, H. et al.; Automatic Routing Algorithm for VLSI, 22 nd Design Automation Conference, 1985, pp. 785-788. | |
| <i>BB</i> ✓ | 53. | Bagga, J. et al., Internal, External, and Mixed Visibility Edges of Polygons. | |
| <i>BB</i> ✓ | 54. | Berger, B. et al., Nearly Optimal Algorithms and Bounds for Multilayer Channel Routing, Journal of the Association for Computing Machinery, pp. 500-542, March 1995. | |
| <i>BB</i> ✓ | 55. | Brady, L. et al., Channel Routing on a 60° Grid, extended abstract, pp.926-931. | |
| <i>BB</i> ✓ | 56. | Carothers, K., A Method of Measuring Nets Routability for MCM's General Area Routing Problems, 1999, pp. 186-192. | |
| <i>BB</i> ✓ | 57. | Chen, D-S. et al., A Wire-Length Minimization Algorithm for Single-Layer Layouts | |

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NON PATENT LITERATURE DOCUMENTS

| | | | |
|------|-----|--|--|
| BB ✓ | 58. | Chen et al., Optimal Algorithms for Bubble Sort Based Non-Manhattan Channel Routing, May 1994, Computer-Aided Design of Integrated Circuits and Systems, IEEE Transactions Volume: 13 Issues, pp. 603-609. | |
| BB ✓ | 59. | Chen, H., Routing L-Shaped Channels in Nonslicing-Structure Placement. 24 th ACM-IEEE Design Automation Conference, pp. 152-165, 1987. | |
| BB ✓ | 60. | Chen, H. et al., Physical Planning of On-Chip Interconnect Architectures, 2002, IEEE, International Conference, pp. 30-35 | |
| BB ✓ | 61. | Chen, S.-S. et al., A New Approach to the Ball Grid Array Package Routing, IEICE Trans. Fundamentals, Vol. E82-A, No. 11, November, 1999, pp. 2599-2608. | |
| BB ✓ | 62. | Cheng, K. et al., Manhattan or Non Manhattan? A Study of Alternative VLSI Routing Architectures, pp 47-52, 2000. | |
| BB ✓ | 63. | Cheng, K., Steiner Problem in Octilinear Routing Model, A Thesis submitted for the Degree of Master of Science, National University Singapore, 1995, pp. 1-122. | |
| BB ✓ | 64. | Chiang, C. et al., Wirability of Knock-Knee Layouts with 45° Wires, IEEE Transactions on Circuits and Systems, Vol. 38, Issue 6, pp 613-624, June 1991. | |
| BB ✓ | 65. | Cong, J. et al., Efficient Heuristics for the Minimum Shortest Path Steiner Arborescence Problem with Applications to VLSI Physical Design, Cadence Design Systems, pp.88-95. | |
| BB ✓ | 66. | Cong, J. et al., Multilevel Approach to Full Chip Gridless Routing, 11/2001, IEEE, pp. 396-403. | |
| BB ✓ | 67. | Cong, J. et al., Performance Driven Multi-Layer General Routing for PCB/MCM Designs, UCLA Computer Science Department, 1998, pp. 356-361. | |
| BB ✓ | 68. | Das, S. et al., Channel Routing in Manhattan-Diagonal Model, 9 th International Conference on VLSI Design, January 1996. pp. 43-48. | |
| BB ✓ | 69. | Das, S. et al., Routing of L-Shaped Channels, Switchboxes and Staircases in Manhattan-Diagonal Model, pp. 65-70, January 1998. | |
| BB ✓ | 70. | Enbody, R. et al., Near-Optimal n-Layer Channel Routing, 23 rd Design Automation Conference, 1986, pp. 708-714. | |
| BB ✓ | 71. | Finch, A.C. et al., A Method for Gridless Routing of Printed Circuit Boards, 22 nd Design Automation Conference, 1985 ACM, pp. 509-515. | |
| BB ✓ | 72. | Gao, S. et al., Channel Routing of Multiterminal Nets, Journal of the Association for Computing Machinery, Vol. 41, No. 4, July 1994, pp. 791-818. | |

| | | | |
|--------------------|---------------------|-----------------|----------|
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| | | | | First Named Inventor | Steven Teig et al. |
| | | | | Group Art Unit | 3028 2825 |
| | | | | Examiner Name | Chencinski, S. Fowler |
| Sheet | 7 | of | 9 | Attorney Docket Number | SPLX.P0074 |

NON PATENT LITERATURE DOCUMENTS

| | | | |
|------|-----|---|--|
| BB ✓ | 73. | Gao, T. et al., Minimum Crosstalk Channel Routing, pp. 692-696, 1993 IEEE. | |
| BB ✓ | 74. | Gao, T. et al., Minimum Crosstalk Switchbox Routing, pp. 610-615, 1994 ACM | |
| BB ✓ | 75. | Gonzalez, T. et al., A Linear Time-Algorithm for Optimal Routing, Journal of the Association for Computing Machinery, vol. 35, No. 4, October 1988, pp.810-831. | |
| BB ✓ | 76. | Guibas, L. et al., Optimal Shortest Path Queries in a Simple Polygon, 1987 ACM, pp.50-63. | |
| BB ✓ | 77. | Hachtel, G.D. et al., Linear Complexity Algorithms for Hierarchical Routing, 1/89, IEEE pp 64-80 | |
| BB ✓ | 78. | Hershberger, J., Efficient Breakout Routing in Printed Circuit Boards, Computational Geometry, 1997, ACM, pp. 460-462. | |
| BB ✓ | 79. | Hershberger, J., Finding the Visibility Graph of a Simple Polygon in Time Proportional to its Size, Preliminary Version, 1987 ACM, pp. 11-20. | |
| BB ✓ | 80. | Hightower, D., A Solution to Line-Routing Problems on the Continuous Plane, Bell Laboratories, Inc., pp. 11-34. | |
| BB ✓ | 81. | Iso, N. et al., Efficient Routability Checking for Global Wires in Planar Layouts, IEICE Trans. Fundamentals, Vol.E80-A, No. 10 October 1997, pp. 1878-1882. | |
| BB ✓ | 82. | Khoo, K. et al., An Efficient Multilayer MCM Router Based on Four-Via Routing, 30 th ACM/IEEE Design Automation Conference, 1993, pp. 590-595. | |
| BB ✓ | 83. | Ladage, L. et al., Resistance Extraction Using a Routing Algorithm, 30 th ACM/IEEE Design Automation Conference, 1993, pp. 38-42. | |
| BB ✓ | 84. | Leach, G., Improving Worst-case Optimal Delaunay Triangulation Algorithms, Department of Computer Science, June 15, 1992, pp. 1-7. | |
| BB ✓ | 85. | Leiserson, C. et al., Algorithms for Routing and Testing Routability of Planar VLSI Layouts, pp. 69-78, May 1985. | |
| BB ✓ | 86. | Lillis, J. et al., New Performance Driven Routing Techniques With Explicit Area/Delay Tradeoff and Simultaneous Wire Sizing, 33 rd Design Automation Conference, 1996. | |
| BB ✓ | 87. | Lipski, W. et al., A Unified Approach to Layout Wirability, Mathematical Systems Theory, 1987, pp. 189-203. | |

| | | | |
|--------------------|---------------------|-----------------|----------|
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| | | | | Examiner Name | Chencinski, S. Bower |
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NON PATENT LITERATURE DOCUMENTS

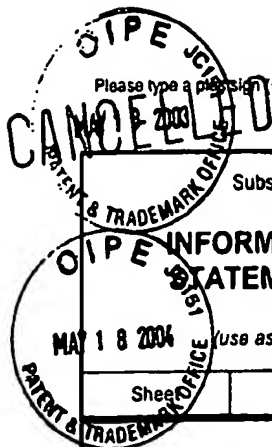
| | | | |
|------|------|--|--|
| BB ✓ | 88. | Lodi, E. et al., A 2d Channel Router for the Diagonal Model, pp. 111-125, April 1991. | |
| BB ✓ | 89. | Lodi, E. et al., A Preliminary Study of a Diagonal Channel-Routing Model, Algorithmica, 1989, pp.585-597. | |
| BB ✓ | 90. | Lodi, E. et al., Lecture Notes in Computer Science, A 4d Channel router for a two layer diagonal model, pp. 464-476, July 1988. | |
| BB ✓ | 91. | Lodi, E. et al., Routing in Times Square Mode, pp. 41-48, June 1990 | |
| BB ✓ | 92. | Lodi, E. et al., Routing Multiterminal Nets in a Diagonal Model, pp. 899-902, 1988. | |
| BB ✓ | 93. | Murooka, T. et al., Simplified Routing Procedure for a CAD-Verified FPGA, IEICE Trans. Fundamentals, Vol. E82-A, No. 11 November 1999, pp. 2440-2447. | |
| BB ✓ | 94. | Naclerio, N. et al., Via Minimization for Gridless Layouts, 24 th ACM/IEEE Design Automation Conference, 1987, pp.159-165. | |
| BB ✓ | 95. | Nam, G. et al, Satisfiability-Based Layout Revisited: Detailed Routing of Complex FPGAs Via Search-Based Boolean SAT, 1999, pp. 167-175. | |
| BB ✓ | 96. | Nestor, J. A New Look at Hardware Maze Routing, Proceedings of the 12 th ACM Symposium on Great Lakes Symposium on VLSI, pp 142-147, April 2002. | |
| BB ✓ | 97. | Ng, C., A "Gridless" Variable-Width Channel Router for Macro Cell Design, 24 th ACM/IEEE Design Automation Conference, 1987, pp. 633-636. | |
| BB ✓ | 98. | Olaverri, A.G. et al., On the Minimum Size of Visibility Graphs. | |
| BB ✓ | 99. | Overtone, G., EDA Underwriter 2 Finding Space in a Multi-Layer Board, Electronic Engineering, Morgan-Grampian LTD, March 1995, vol. 67, no. 819, pp 29-30. | |
| BB ✓ | 100. | Pocchiola, M., Computing the Visibility Graph via Pseudo-Triangulations, 11 th Computational Geometry, Vancouver, Canada, 1995 ACM, pp. 248-257. | |
| BB ✓ | 101. | Powers, K. et al., The 60° Grid: Routing Channels in Width d/square root 3, VLSI, 1991, Proceedings., First Great Lakes Symposium on Kalamazoo, MI, USA, pp 214-291, March 1991. | |
| BB ✓ | 102. | Royte, J. et al., Geometric Compaction in One Dimension for Channel Routing, 24 th ACM/IEEE Design Automation Conference, 1987, pp 140-145. | |

| | | | |
|--------------------|-------------------|-----------------|----------|
| Examiner Signature | <i>John Bower</i> | Date Considered | 12/13/04 |
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| Sheet 9 of 9 | | | | Group Art Unit | 3828 2826 |
| | | | | Examiner Name | Ghencinski, S. <i>Bower</i> |
| | | | | Attorney Docket Number | SPLX.P0074 |

NON PATENT LITERATURE DOCUMENTS

| | | | |
|------|------|---|--|
| BB ✓ | 103. | Schiele, W. et al., A Gridless Router for Industrial Design Rule, 27 th ACM-IEEE Design Automation Conference, pp. 626-631, 1990. | |
| BB ✓ | 104. | Sekiyama, Y. et al., Timing-Oriented Routers for PCB Layout Design of High-Performance Computers, International Conference on Computer Aided Design, pp 332-335, November 1991. | |
| BB ✓ | 105. | Soukup, J. et al., Maze Router Without a Grid Map, IEEE, 1992, pp. 382-385. | |
| BB ✓ | 106. | Takashima, Y. et al, Routability of FPGAs with Extremal Switch-Block Structures, IEICE Trans. Fundamentals, vol. E81-A, No. 5, May 1998, pp. 850-856. | |
| BB ✓ | 107. | Teig, S. The X Architecture: Not your Father's Diagonal Wiring, International Workshop on System Level Interconnect Prediction, pp. 33-37, April 2002. | |
| BB ✓ | 108. | Thakur, S. et al., Algorithms for a Switch Module Routing Problem, 1994, pp. 265-270. | |
| BB ✓ | 109. | Theune, D. et al., HERO: Hierarchical EMC-constrained routing, 11/1992, IEEE pp 468-472. | |
| BB ✓ | 110. | Tollis, I. Techniques for Wiring in Non-Square Grids, pp. 66-69, May 1989. | |
| BB ✓ | 111. | Urrutia, J., On the Number of Internal and External Visibility Edges of Polygons, Department of CS, University of Ottawa, ON, Canada, February 11, 1997. | |
| BB ✓ | 112. | Wang, D., Novel Routing Schemes for IC Layout, Part I: Two-Layer Channel Routing, 28 th ACM/IEEE Automation Conference, 1991, pp.49-53. | |
| BB ✓ | 113. | Yan et al., Three-Layer Bubble-Sorting -Based Non-Manhattan Channel Routing, ACM Transactions on Design Automation of Electronic Systems, Vol. 5, No. 3, July 2000, pp.726-734. | |
| BB ✓ | 114. | Zhou, H. et al., An Optimal Algorithm for River Routing with Crosstalk Constraints, 1996 | |
| BB ✓ | 115. | Zhou, H. et al., Optimal River Routing with Crosstalk Constraints, ACM Transactions on Design Automation of Electronic Systems, vol. 3, No. 3, July 1998, pp. 496-514. | |

| | | | |
|--------------------|---------------------|-----------------|----------|
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| <p>Application Number: 10/066095</p> <p>Confirmation Number: 6009</p> <p>First Named Applicant: Steven Teig</p> <p>Attorney Docket Number: SPLX.P0074</p> <p>Art Unit: 3828 <i>2825</i></p> <p>Examiner: SIEGFRIED E. CHENCINSKI <i>Bauer</i></p> <p>Search string: (4615011 or 4782193 or 5633479 or 5634093 or 5635736 or 6128767 or 6219823 or 6226560 or 6262487 or 6295634 or 6436804 or 6490713 or 6546540 or 6645842 or 4673966 or 4855929 or 5360948 or 5375069 or 5532934 or 5578840 or 5618744 or 5636125 or 5637920 or 5650653 or 5657242 or 5659484 or 5663891 or 5717600 or 5723908 or 5742086 or 5757089 or 5757656 or 5777360 or 5811863 or 5822214 or 5838583 or 5859449 or 5889329 or 5889677 or 5898597 or 5914887 or 5973376 or 5980093 or 6035108 or 6038383 or 6058254 or 6067409 or 6068662 or 6088519 or 6111756 or 20020104061 or 20020100009 or 20020107711 or 20020182844 or 20030005399 or 20030188281 or 20010003843 or 20020174413 or 20030025205 or 20030121017).pn.</p> <p>US Patent Documents</p> <p>Note: Applicant is not required to submit a paper copy of cited US Patent Documents</p> <table border="1"><thead><tr><th>init</th><th>Cite.No.</th><th>Patent No.</th><th>Date</th><th>Patentee</th><th>Kind</th><th>Class</th><th>Subclass</th></tr></thead><tbody><tr><td><i>16</i></td><td>1</td><td>4615011</td><td>1986-09-30</td><td>Linsker</td><td></td><td></td><td></td></tr><tr><td><i>06</i></td><td>2</td><td>4782193</td><td>1988-11-01</td><td>Linsker</td><td></td><td></td><td></td></tr><tr><td><i>40</i></td><td>3</td><td>5633479</td><td>1997-05-27</td><td>Hirano</td><td></td><td></td><td></td></tr><tr><td><i>10</i></td><td>4</td><td>5634093</td><td>1997-05-27</td><td>Ashida et al.</td><td></td><td></td><td></td></tr><tr><td><i>04</i></td><td>5</td><td>5635736</td><td>1997-06-03</td><td>Funaki et al.</td><td></td><td></td><td></td></tr><tr><td><i>00</i></td><td>6</td><td>6128767</td><td>2000-10-03</td><td>Chapman</td><td></td><td></td><td></td></tr></tbody></table> | | init | Cite.No. | Patent No. | Date | Patentee | Kind | Class | Subclass | <i>16</i> | 1 | 4615011 | 1986-09-30 | Linsker | | | | <i>06</i> | 2 | 4782193 | 1988-11-01 | Linsker | | | | <i>40</i> | 3 | 5633479 | 1997-05-27 | Hirano | | | | <i>10</i> | 4 | 5634093 | 1997-05-27 | Ashida et al. | | | | <i>04</i> | 5 | 5635736 | 1997-06-03 | Funaki et al. | | | | <i>00</i> | 6 | 6128767 | 2000-10-03 | Chapman | | | |
| init | Cite.No. | Patent No. | Date | Patentee | Kind | Class | Subclass | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| <i>06</i> | 2 | 4782193 | 1988-11-01 | Linsker | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <i>40</i> | 3 | 5633479 | 1997-05-27 | Hirano | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <i>10</i> | 4 | 5634093 | 1997-05-27 | Ashida et al. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <i>04</i> | 5 | 5635736 | 1997-06-03 | Funaki et al. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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|----|----|---------|------------|--------------------|----|
| Ba | 7 | 6219823 | 2001-04-17 | Hama et al. | B1 |
| | 8 | 6226560 | 2001-05-01 | Hama et al. | B1 |
| | 9 | 6262487 | 2001-07-17 | Igarashi et al. | B1 |
| | 10 | 6295634 | 2001-09-25 | Matsumoto | B1 |
| | 11 | 6436804 | 2002-08-20 | Igarashi et al. | B2 |
| | 12 | 6490713 | 2002-12-03 | Matsumoto | B2 |
| | 13 | 6546540 | 2003-04-08 | Igarashi et al. | B1 |
| | 14 | 6645842 | 2003-11-11 | Igarashi et al. | B2 |
| | 15 | 4673966 | 1987-06-16 | Shimoyama | |
| | 16 | 4855929 | 1989-08-08 | Nakajima | |
| | 17 | 5360948 | 1994-11-01 | Thornberg | |
| | 18 | 5375069 | 1994-12-20 | Satoh et al. | |
| | 19 | 5532934 | 1996-07-02 | Rostoker | |
| | 20 | 5578840 | 1996-11-26 | Scepanovic et al. | |
| | 21 | 5618744 | 1997-04-08 | Suzuki et al. | |
| | 22 | 5636125 | 1997-06-03 | Rostoker et al. | |
| | 23 | 5637920 | 1997-06-10 | Loo | |
| | 24 | 5650653 | 1997-07-22 | Rostoker et al. | |
| | 25 | 5657242 | 1997-08-12 | Sekiyama et al. | |
| | 26 | 5659484 | 1997-08-19 | Bennett et al. | |
| | 27 | 5663891 | 1997-09-02 | Bamji et al. | |
| | 28 | 5717600 | 1998-02-10 | Ishizuka | |
| | 29 | 5723908 | 1998-03-03 | Fuchida et al. | |
| | 30 | 5742086 | 1998-04-21 | Rostoker et al. | |
| | 31 | 5757089 | 1998-05-26 | Ishizuka | |
| | 32 | 5757656 | 1998-05-26 | Hershberger et al. | |
| | 33 | 5777360 | 1998-07-07 | Rostoker et al. | |
| | 34 | 5811863 | 1998-09-22 | Rostoker et al. | |
| | 35 | 5822214 | 1998-10-13 | Rostoker et al. | |
| | 36 | 5838583 | 1998-11-17 | Varadarajan et al. | |
| | 37 | 5859449 | 1999-01-12 | Kobayashi et al. | |
| | 38 | 5889329 | 1999-03-30 | Rostoker et al. | |
| | 39 | 5889677 | 1999-03-30 | Yasuda et al. | |
| | 40 | 5898597 | 1999-04-27 | Scepanovic et al. | |
| | 41 | 5914887 | 1999-06-22 | Scepanovic et al. | |
| B | 42 | 5973376 | 1999-10-26 | Rostoker et al. | |

| | | | | |
|----|----|---------|------------|-------------------|
| BA | 43 | 5980093 | 1999-11-09 | Jones et al. |
| | 44 | 6035108 | 2000-03-07 | Kikuchi |
| | 45 | 6038383 | 2000-03-14 | Young et al. |
| | 46 | 6058254 | 2000-05-02 | Scepanovic et al. |
| | 47 | 6067409 | 2000-05-23 | Scepanovic et al. |
| | 48 | 6068662 | 2000-05-30 | Scepanovic et al. |
| | 49 | 6088519 | 2000-07-11 | Koford |
| ✓ | 50 | 6111756 | 2000-08-29 | Moresco |

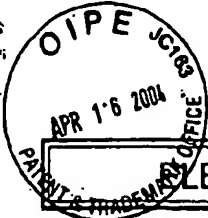
US Published Applications

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| init | Cite.No. | Pub. No. | Date | Applicant | Kind | Class | Subclass |
|------|----------|-------------|------------|-------------------|------|-------|----------|
| BA | 1 | 20020104061 | 2001-11-30 | Xing et al. | A1 | | |
| | 2 | 20020100009 | 2002-07-25 | Xing et al. | A1 | | |
| | 3 | 20020107711 | 2002-08-08 | Xing et al. | A1 | | |
| | 4 | 20020182844 | 2002-12-05 | Igarashi et al. | A1 | | |
| | 5 | 20030005399 | 2003-01-02 | Igarashi et al. | A1 | | |
| | 6 | 20030188281 | 2003-10-02 | Xing | A1 | | |
| | 7 | 20010003843 | 2001-06-14 | Scepanovic et al. | A1 | | |
| | 8 | 20020174413 | 2002-11-21 | Tanaka | A1 | | |
| | 9 | 20030025205 | 2003-02-06 | Shively | A1 | | |
| ✓ | 10 | 20030121017 | 2003-06-26 | Andreev et al. | A1 | | |

Signature


| Examiner Name | Date |
|----------------------|----------|
| <i>Barbara Rowan</i> | 12/13/04 |



ELECTRONIC INFORMATION DISCLOSURE STATEMENT

Electronic Version v18

Stylesheet Version v18.0

| Title of Invention | Method and apparatus for routing groups of paths | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| <p>Application Number: 10/066095 </p> <p>Confirmation Number: 6009</p> <p>First Named Applicant: Steven Teig</p> <p>Attorney Docket Number: SPLX.P0074</p> <p>Art Unit: 3028 1326</p> <p>Examiner: SIEGERIED E CHENCINSKI <i>Bower</i></p> <p>Search string: (6123736 or 6155725 or 6166441 or 6175950 or 6209123 or 6216252 or 6219832 or 6230306 or 6247167 or 6253363 or 6260179 or 6289495 or 6292929 or 6301686 or 6324674 or 6324675 or 6327693 or 6327694 or 6330707 or 6378121 or 6385758 or 6401234 or 6405358 or 6407434 or 6412097 or 6412102 or 6463575 or 6473891 or 6519751 or 6526555 or 6543043 or 6557145 or 6567967 or 6586281 or 6665852).pn.</p> <p>US Patent Documents</p> <p>Note: Applicant is not required to submit a paper copy of cited US Patent Documents</p> <table border="1"><thead><tr><th>init</th><th>Cite.No.</th><th>Patent No.</th><th>Date</th><th>Patentee</th><th>Kind</th><th>Class</th><th>Subclass</th></tr></thead><tbody><tr><td><i>69</i></td><td>1</td><td>6123736</td><td>2000-09-26</td><td>Pavisic et al.</td><td></td><td></td><td></td></tr><tr><td></td><td>2</td><td>6155725</td><td>2000-12-05</td><td>Scepanovic et al.</td><td></td><td></td><td></td></tr><tr><td></td><td>3</td><td>6166441</td><td>2000-12-26</td><td>Geryk</td><td></td><td></td><td></td></tr><tr><td></td><td>4</td><td>6175950</td><td>2001-01-16</td><td>Scepanovic et al.</td><td>B1</td><td></td><td></td></tr><tr><td></td><td>5</td><td>6209123</td><td>2001-03-27</td><td>Maziasz et al.</td><td>B1</td><td></td><td></td></tr><tr><td></td><td>6</td><td>6216252</td><td>2001-04-10</td><td>Dangelo et al.</td><td>B1</td><td></td><td></td></tr><tr><td></td><td>7</td><td>6219832</td><td>2001-04-17</td><td>Buzbee</td><td>B1</td><td></td><td></td></tr><tr><td></td><td>8</td><td>6230306</td><td>2001-05-08</td><td>Raspopovic et al.</td><td>B1</td><td></td><td></td></tr><tr><td></td><td>9</td><td>6247167</td><td>2001-06-12</td><td>Raspopovic et al.</td><td>B1</td><td></td><td></td></tr><tr><td></td><td>10</td><td>6253363</td><td>2001-06-26</td><td>Gasanov et al.</td><td>B1</td><td></td><td></td></tr><tr><td></td><td>11</td><td>6260179</td><td>2001-07-10</td><td>Ohsawa et al.</td><td>B1</td><td></td><td></td></tr><tr><td></td><td>12</td><td>6289495</td><td>2001-09-11</td><td>Raspopovic et al.</td><td>B1</td><td></td><td></td></tr></tbody></table> | | | | | | | | init | Cite.No. | Patent No. | Date | Patentee | Kind | Class | Subclass | <i>69</i> | 1 | 6123736 | 2000-09-26 | Pavisic et al. | | | | | 2 | 6155725 | 2000-12-05 | Scepanovic et al. | | | | | 3 | 6166441 | 2000-12-26 | Geryk | | | | | 4 | 6175950 | 2001-01-16 | Scepanovic et al. | B1 | | | | 5 | 6209123 | 2001-03-27 | Maziasz et al. | B1 | | | | 6 | 6216252 | 2001-04-10 | Dangelo et al. | B1 | | | | 7 | 6219832 | 2001-04-17 | Buzbee | B1 | | | | 8 | 6230306 | 2001-05-08 | Raspopovic et al. | B1 | | | | 9 | 6247167 | 2001-06-12 | Raspopovic et al. | B1 | | | | 10 | 6253363 | 2001-06-26 | Gasanov et al. | B1 | | | | 11 | 6260179 | 2001-07-10 | Ohsawa et al. | B1 | | | | 12 | 6289495 | 2001-09-11 | Raspopovic et al. | B1 | | |
| init | Cite.No. | Patent No. | Date | Patentee | Kind | Class | Subclass | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <i>69</i> | 1 | 6123736 | 2000-09-26 | Pavisic et al. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2 | 6155725 | 2000-12-05 | Scepanovic et al. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 3 | 6166441 | 2000-12-26 | Geryk | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 4 | 6175950 | 2001-01-16 | Scepanovic et al. | B1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 5 | 6209123 | 2001-03-27 | Maziasz et al. | B1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 6 | 6216252 | 2001-04-10 | Dangelo et al. | B1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 7 | 6219832 | 2001-04-17 | Buzbee | B1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 8 | 6230306 | 2001-05-08 | Raspopovic et al. | B1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 9 | 6247167 | 2001-06-12 | Raspopovic et al. | B1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 10 | 6253363 | 2001-06-26 | Gasanov et al. | B1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 11 | 6260179 | 2001-07-10 | Ohsawa et al. | B1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 12 | 6289495 | 2001-09-11 | Raspopovic et al. | B1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Bower

| | | | | | |
|----|----|---------|------------|-------------------|----|
| BB | 13 | 6292929 | 2001-09-18 | Scepanovic et al. | B2 |
| | 14 | 6301686 | 2001-10-09 | Kikuchi et al. | B1 |
| | 15 | 6324674 | 2001-11-27 | Andreev et al. | B2 |
| | 16 | 6324675 | 2001-11-27 | Dutta et al. | B1 |
| | 17 | 6327693 | 2001-12-04 | Cheng et al. | B1 |
| | 18 | 6327694 | 2001-12-04 | Kanazawa | B1 |
| | 19 | 6330707 | 2001-12-11 | Shinomiya et al. | B1 |
| | 20 | 6378121 | 2002-04-23 | Hiraga | B2 |
| | 21 | 6385758 | 2002-05-07 | Kikuchi et al. | B1 |
| | 22 | 6401234 | 2002-06-04 | Alpert et al. | B1 |
| | 23 | 6405358 | 2002-06-11 | Nuber | B1 |
| | 24 | 6407434 | 2002-06-18 | Rostoker et al. | B1 |
| | 25 | 6412097 | 2002-06-25 | Kikuchi et al. | B1 |
| | 26 | 6412102 | 2002-06-25 | Andreev et al. | B1 |
| | 27 | 6463575 | 2002-10-08 | Takahashi | B1 |
| | 28 | 6473891 | 2002-10-29 | Shively | B1 |
| | 29 | 6519751 | 2003-02-11 | Sriram et al. | B2 |
| | 30 | 6526555 | 2003-02-25 | Teig et al. | B1 |
| | 31 | 6543043 | 2003-04-01 | Wang et al. | B1 |
| | 32 | 6557145 | 2003-04-29 | Boyle et al. | B2 |
| | 33 | 6567967 | 2003-05-20 | Greidinger et al. | B2 |
| ✓ | 34 | 6586281 | 2003-07-01 | Gabara et al. | B1 |
| ✓ | 35 | 6665852 | 2003-12-16 | Xing et al. | B2 |

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|-----------------------|----------|
| Examiner Name | Date |
| <i>Arthur Pomeroy</i> | 12/13/04 |



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| | | | | Application Number | 10/066,095 |
| | | | | Filing Date | 1/31/2002 |
| | | | | First Named Inventor | Steven Teig, et al. |
| | | | | Group Art Unit | 2825 |
| | | | | Examiner Name | Brandon Bowers |
| Sheet | 1 | of | 1 | Attorney Docket Number: | SPLX.P0074 |

| FOREIGN PATENT DOCUMENTS | | | | | | |
|--------------------------|--------------------------|-------------------------|---|--------------------------------------|--|---|
| Examiner Initials | Cite No. ¹ | Foreign Patent Document | | Date of Publication MM-DD-YYYY | Name of Patentee or Applicant of Cited Document | Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear |
| | | Office ² | Number ³ Kind Code (if known) ⁴ | | | |
| BB | 1. | JP | 02-262354 | 10-25-1990 | Kuribayashi, Mototaka | |

| NON PATENT LITERATURE DOCUMENTS | | | | |
|---------------------------------|--------------------------|---|--|--|
| Examiner Initials | Cite No. ¹ | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published. | | |
| BB | 2. | CHO J.D., Wiring Space and Length Estimation in Two-Dimensional Arrays, May 2000, Computer-Aided Design of Integrated Circuits and Systems, IEEE Transactions on, VOL. 19, Iss. 5, pp. 612-615. | | |
| BB | 3. | CONG J. et al., DUNE - A Multilayer Gridless Routing System, May 2001, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems, vol 20, iss. 5, pp. 633-647. | | |
| BB | 4. | DION J. et al., Contour: A Tile-based Gridless Router, March 1995, Digital Western Research Laboratory, research Report 95-3, pp. 1-22. | | |
| BB | 5. | JUTTNER et al., "Lagrange Relaxation Based Method for the QoS Routing Problem, IEEE, Apr. 26, 2001, pp 259-268. | | |
| BB | 6. | SCHULZ U., Hierarchical Physical Design System, CompEuro '89, VLSI and Computer Peripherals. VLSI and Microelectronic Applications in Intelligent Peripherals and their Interconnection Networks. Proceedings, 8-12 May 1989, pp. 5/20 - 5/24. | | |
| BB | 7. | TSENG H-P. et al., A Gridless Multilayer Router for Standard Cell Circuits Using CTM Cells, Oct. 1999, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems, vol 18, iss. 10, pp. 1462-1479. | | |

| | | | |
|-----------------------|--|--------------------|----------|
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